

# REVIEW RESOURCES

## Lesson 9: Financial Management: Cost Estimation

### Budget Terms

Each of these terms has an official definition in budget execution.

TERM	DEFINITION
Budget Authority	"Budget Authority" is the authority granted by appropriations law to enter into obligations that will result in immediate or future outlays.
Commitment	A "commitment" is the administrative reservation of funds, usually by the local comptroller, in anticipation of a future obligation. A commitment is the response to a request for a spending action. It ensures that funds are available in the amount requested, in the correct fiscal year, and in the proper appropriation.
Obligation	An "obligation" is the legal reservation of funds to make a future payment of money. The obligation is incurred as soon as an order is placed, or a contract is awarded for the delivery of goods and performance of services.
Expenditure	An "expenditure" is a charge against available funds. It results from a voucher, claim, or other document approved by a competent authority. Expenditure represents the presentation of a check or electronic transfer of funds to the performer of the work.
Outlay	An "outlay" occurs when a vendor cashes the expenditure check and money flows from the Treasury to the vendor or supplier. With the advent of Electronic Funds Transfer (EFT), the time between an expenditure and outlay can be instantaneous.

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### Scope of Life-Cycle Costs (LCC)

The Life-Cycle Cost is the total cost to the Government for a system over its entire life.

LCC includes all costs for:

- Research and development
- Investment (production and fielding)
- Facilities
- Operations
- Maintenance
- Environmental concerns
- Disposal

### Life-Cycle Cost Estimates (LCCes)

All military departments and defense agencies perform Life-Cycle Cost Estimates (LCCEs) for their acquisition process. An LCCE:

- Is a very comprehensive estimate.
- Tries to identify all the costs from program initiation through disposal of the system from the inventory.
- Can span decades.

### Purposes of Life-Cycle Cost Estimates

LCCEs have two primary purposes:

- Serve as the cost input for decisions on whether or not to continue, modify, or terminate development, production, and fielding of a system.
- Provide the basis for budget requests to Congress.

### Life-Cycle Costs

DOD 5000.4-M, Chapter 3, takes the total Life-Cycle Cost of an acquisition program and breaks it down in three ways:

#### 1. Appropriation Categories

Appropriation categories are types of funds used by the Government and consist of:

- Research, Development, Test, and Evaluation (RDT&E)
- Procurement
- Operations and Maintenance (O&M)
- Military Construction (MILCON)
- Military Personnel (MILPERS)

#### 2. Work Breakdown Structure (WBS)

A Work Breakdown Structure (WBS) is an organized method to break down a project into logical subdivisions at lower and lower levels of detail.

A Life-Cycle Cost Estimate uses the WBS to aggregate and show costs by system and subsystem.

#### 3. Life-Cycle Cost Categories

The life cycle cost categories consist of:

CATEGORY	DEFINITION
<b>Research and Development (R&amp;D)</b>	R&D consists of all the costs associated with the research and development phases (i.e., Concept Exploration, Program Definition and Risk Reduction, and Engineering and Manufacturing Development).
<b>Investment (Production and Fielding)</b>	Investment costs include the cost of the investment phase (i.e., Production and Fielding of the system): the total cost of procuring the prime equipment, its related support equipment, facilities, initial spares, and fielding of the system.

**Operations and Support (O&S)**

O&S costs include the cost of the Operations and Support phase—all costs incurred in using the system including: personnel, fuel, maintenance (unit and depot), sustaining investments (replenishment spares), and training.

**Disposal**

Disposal costs include the cost to dispose of the system after its useful life. These costs are associated with disposing of the materiel system and include environmental and related costs. DOD 5000.2-R requires that these costs be estimated and included in the system's life cycle cost.

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## Cost-Estimating Techniques

Each of the four major cost-estimating techniques has its strengths and weaknesses.

1. **Analogy:** Subjectively compares the new system with one or more existing similar systems for which there is accurate cost and technical data.

### Strengths

- Quick
- Inexpensive
- Easy to change

### Weaknesses

- Subjective
- Not as precise

2. **Parametric:** Sometimes known as the statistical method, this technique:
  - Generates an estimate based on system performance or design characteristics.
  - Uses a database of elements from similar systems.
  - Differs from Analogy in that:
    - Uses multiple systems.
    - Makes statistical inferences about the cost estimating relationships (CER).

### Strengths

- Uses cost estimating relationships
- Easy to do "what-if drills"
- Inexpensive

### Weaknesses

- Moderately subjective
- Precision only as good as the data base

3. **Engineering:** "Bottom-up" method of cost analysis that is the most detailed of all the techniques and the most costly to implement. Each WBS element must be costed to build the cost estimate for the entire program.

### Strengths

- Very accurate in later stages of Engineering and Manufacturing Development (EMD)
- Limited subjectivity

### Weaknesses

- Very expensive
- Very time-consuming
- Difficult to do "what-if drills"

4. **Actual Costs:** Extrapolation from actual costs that were contracted for or actually incurred on that system during an earlier period.

Strengths

- Little subjectivity
- Very accurate

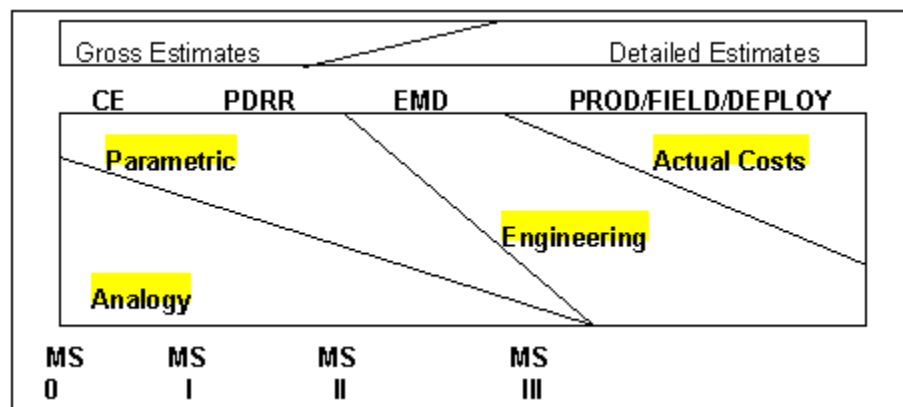
Weaknesses

- Little applicability
- Budget may already be submitted

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## Estimating Technique and the Acquisition Life Cycle

The use of each technique is based on the information available to support it. The following figure is a summary of the usual application of each technique in the acquisition process.


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## Cost Estimate Types

All programs will normally be required to have a cost estimate completed when they come to a milestone review. The type of estimate required and the organization that prepares the estimate varies depending primarily on the program's ACAT level.

The three types of cost estimates are:

- Program Office Estimate (POE)
- Component Cost Analysis (CCA)
- Independent Cost Estimate (ICE)

### Program Office Estimate (POE)

DOD 5000.2-R requires the program office to prepare a life cycle cost estimate for all ACAT I and ACAT IA programs, which should cover all costs from program initiation through disposal.

This estimate is:

- Prepared in support of program initiation and for subsequent milestone reviews.
- Not required by regulation for programs other than ACAT I and ACAT IA, but the PM will probably be required to prepare a POE for other ACAT programs for all milestone reviews.

### Component Cost Analysis (CCA)

Each of the Army, Navy, and Air Force Service headquarters has a cost analysis agency that prepares a separate and distinct cost estimate on programs.

This estimate:

- Is required for ACAT IA programs at milestones I and II.
- Is performed on the programs at the discretion of the Component Acquisition Executive (CAE).
- Serves as the independent cost estimate (ICE) for ACAT IC programs.

The Service cost analysis agency that prepares the CCA also reviews POE computations, methodologies, and assumptions.

The Component Acquisition Executive approves the Service cost position that is derived from the reconciliation between the CCA and the POE.

### **Independent Cost Estimate (ICE)**

The OSD Cost Analysis Improvement Group (CAIG) is an organization outside the Service acquisition community chain. The CAIG prepares a separate and distinct cost estimate on ACAT ID programs, known as the Independent Cost Estimate.

This estimate is:

- Required by Title 10, U.S. Code for all ACAT I programs prior to MS II and III.
- Required by regulation for all ACAT I programs prior to MS I, II, and III.

Title 10, U.S. Code, Section 2434 prescribes that the Secretary of Defense may not approve a Major Defense Acquisition Program (MDAP) entering either the Engineering and Manufacturing Development (EMD) or the Production/Deployment phases unless "a manpower estimate and Independent Cost Estimate (ICE) of the program's life cycle cost is first submitted to the Secretary."

### **Cost Analysis Requirements Description (CARD)**

In preparation for a milestone review the program office prepares the Cost Analysis Requirements Description for ACAT I and ACAT IA programs. The CARD document:

- Is used to develop the POE, CCA, and ICE.
- Describes the specifications of the program and assumptions the program office used in preparing the POE.
- Is provided to other groups that perform cost estimates on the program.
- Helps ensure all groups are costing out the same "program."

### **OSD Cost Analysis Improvement Group (CAIG)**

In addition to preparing the ICE, the CAIG also:

- Advises the Defense Acquisition Board (DAB) on matters concerning the estimation, review, and presentation of cost analysis.
- Serves as the principle advisory body to the Secretary of Defense on matters relating to cost.
- Develops common cost-estimating procedures for DOD.

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## **Cost Estimate Review Process**

The overall process of creating, reconciling, and approving a program cost estimate involves several key organizations. The following summarizes the participants and their roles.

PARTICIPANTS	ROLES
Program Office	The Program Office Estimate is prepared.
Component Cost Analysis Organization	<p>The Component Cost Analysis is prepared (if required).</p> <ul style="list-style-type: none"> <li>• While each service prepares for a Milestone Review slightly differently, each generally follows a similar process.</li> <li>• The POE and the CCA are compared and differences are reconciled.</li> </ul>
Service or Component Assistant Secretary for Financial Management	For programs approved at the service level (i.e., ACAT IC, ACAT IAC, and ACAT II and III programs), cost estimates are taken through the service's Assistant Secretary for Financial Management, and then to the appropriate Service Decision Panel for the milestone recommendation to the Component Acquisition Executive (CAE).
OSD Cost Analysis Improvement Group (CAIG)	For ACAT ID programs, the OSD Cost Analysis Improvement Group completes an Independent Cost Estimate. The ICE and service cost positions are reconciled between representatives from the CAIG and the service involved.
Overarching Integrated Product Team (OIPT)	Both the ICE and the service position are considered by the OIPT in preparing the program for Defense Acquisition Board evaluation.
Defense Acquisition Board (DAB)	The POE and the ICE are used as part of the milestone decision process.

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